Howard, please return, NYC

Circulation 37 July 30, 1975 Number 1

UNIX NEWS

This mailing is the first "permanent" issue of the UNIX NEWS. As previously announced, this will be a bimonthly, mailed at the end of each odd month. Where a special issue is warranted, we will include its contents in the next regularly numbered issue. Preceding this issue, there were three mailings. The first was the invitation to be placed on the mailing list which is reproduced in this issue. The second was a notice of the June 18th New York meeting and the Harvard software. The third was the "special issue" dated July 16 announcing the new edition of UNIX.

There were no objections to publishing the mailing list and so we are including it in this issue. The integer part of the sequence number on the first line corresponds to a list of licensees that Ken Thompson keeps. The fractional part designates multiple installations under a single license. Since we now have several such, we will mail a copy of the newsletter to each, provided we receive a returned copy of the coupon on the invitation to subscribe.

The original letter went to approximately 36 people, all but 6 of whom replied. Subsequent letters recently went to 20 new installations and, to date the mailing list contains 37 names. Our only communications problems are with locations where the only name is a contracts officer and with multiple installations. I would ask each of you to scan the list of names and let me know of any installations you know of which are not on the list.

USER SOFTWARE EXCHANGE

It is apparent that there is lots of user software under UNIX that is of general use and this newsletter's greatest utility is probably in announcing availability of software. We invite discussion in this newsletter of general philosophy with respect to licensing, distribution, costs, and the relation of commercial licensees to software exchange.

NEW YORK MEETING

The meeting on June 18 at the City University of New York was attended by over 40 people from 20 installations. Each installation described briefly its function and idiosyncracies. We will not try to reproduce them here since we expect one page write-ups for subsequent inclusion from each installation. (Several such are included in this issue.) There was unanimous sentiment for keeping the users' group and its newsletter as informal as possible.

Address Correspondence to
Prof. M. Ferentz Physics Dept. Brooklyn College of CUNY Brooklyn, NY 11210

The next meeting in the East will be October 6 at the City University of New York and the following meeting in early spring at Harvard. By October there should be considerable experience with the new system, and by spring general experience with the Harvard system.

Ken Thompson described some of the features of the new system and some benchmarks run on the 11/70. He estimates the new cpu gives a factor of 2.5 improvement in performance for UNIX, and that with the new peripherals the factor is about 3.0.

NEW SYSTEM AVAILABLE

The Sixth Edition - June 1975 of the UNIX system is now available for distribution to licensees. Commercial users should contact Western Electric for details. Academics can receive the new system for a service fee of $150.00. Normal distribution is on 800 bpi - 9 track tape. You need not send a tape, just a check for $150.00 made out to Bell Laboratories, Inc. and sent to:

I. B. Biren, Room 2c-548
Bell Laboratories, Inc.
Computing Information Services Group
Murray Hill, NJ 07974

The tape contains a single file which extracts to 3 RK-packs or equivalent. These contain:

Pack0	The system except for /usr/source
Pack1	/usr/source
Pack2	Documentation in machine readable form

Those who require distribution on RK-packs should send two or three packs along with their checks. The package also includes one hard-copy of each of the 19 documents.

Among the new 'goodies' are:

1) Separate I and D space for the resident monitor on 11/45s and 11/70s
2) Huge files (up to 16 megabytes)
3) A preprocessor for structured Fortran
4) TMG
5) A preprocessor for DC, with arbitrary precision
6) Many fixes and rewrites of system programs from "as" to "c"
7) Much improved comments embedded in system source
8) More graceful death on running out of resources and other crashes

OTHER SOFTWARE AVAILABLE

The MUNIX paper which starts on page 4 announces the availability of their system. I have a recent note from Professor Allen saying he expects to have it available in the very near future.

Harvard has announced the availability in the near future of their software. It will be available to other academic institutions for the nominal cost of reproducing it. The system is running in a heavy-use student environment and they expect to have some documentation by the end of the summer. For details write:

Lewis A. Law
Director of Technical Services
Science Center, Harvard University
1 Oxford Street
Cambridge, Mass. 02138

REQUESTS FOR SOFTWARE

From P. De Souza, Heriot-Watt University:

> We are interested in getting in touch with UNIX users who may have developed a BCPL compiler/interpreter, a driver for a Vector General display, or a software link to a PDP-10

INSTALLATION DESCRIPTIONS

University of Saskatchewan

PDP11/40 with 40Kw of core (expanding to 64Kw)
3 terminals (2 more on order)
1 DC11 dial-up interface and a CDI Teleterm 1030
2 RK11 disk drives (1 on order)
1 DH11 on order to replace current line interfaces

We also have a PDP11/20 with TTY, high speed paper tape and a VT01 display scope. This is currently connected to the PDP11/40 by a DL11-E serial line but will soon be replaced by a DR11-C parallel interface. One current project is to write a monitor for the PDP11/20 so that its peripherals become available to UNIX users.

(Printed on an LA36 from NROFF directly to Hectomaster. Great fun! MF)

MUNIX - A Multiprocessor UNIX

B. E. Allen and G. L. Barksdale, Jr.
Computer Science Group
Naval Postgraduate School
Monterey, California 93940

The Naval Postgraduate School Signal Processing and Display Laboratory is a university laboratory engaged in research efforts in computer graphics, signal processing, operating systems, and hybrid computing. The laboratory is used for student instruction as well as for student and faculty research.

The configuration of the Signal Processing and Display Laboratory is shown in Figure 1. The system can be viewed as a three bus ensemble, with the respective functions of data acquisition, signal processing, and display. When bus cycles are not required by real-time processes, the data acquisition and display busses support program development activities. The display system includes a 256K word fixed head disk, a Ramtek color display, a Tektronix 4014 display with enhanced graphics, a Vector General 3D system, a Hughes Conographic console, a data tablet, a Versatek printer/plotter, and an EPC graphic recorder. Peripherals for the Data Acquisition controller include both large (96M words) and small (2.5M words) disk systems, magnetic tapes, a card reader, a line printer, and a sixteen line programmable terminal multiplexer. Dual ported core memory (88K words) is accessible from either UNIBUS. The signal processing subsystem consists of a CSP 125 controller with 4K words of 125 nanosecond memory, an array processor, and two

16K word banks of three ported memory. UNIX compatible device drivers have been developed for each of these peripherals.

To control this diverse hardware suite, we have evolved MUNIX, a tightly-coupled symmetric multiprocessor version of UNIX. A single copy of the system residing in shared memory is executed by both processors independently. P and V operators are used for synchronization. In order to provide the increased address space necessary to support the multiprocessor system, UNIX was modified to seperate kernel I and D space. In support of the signal acquisition research, a new process classification, real-time, has been added. When a process is granted real-time status, it is locked in memory, given the highest priority possible, and preemptively allocated a processor whenever it comes ready.

Other completed work includes the development of a dynamic symbolic debugging tool having breakpoint capability, a rather basic PDP 11 virtual machine monitor which executes under MUNIX, several on-line diagnostic packages, a line editor which facilitates correction of typing mistakes, system calls which gracefully stop or bootstrap the system, and enhancements to the text editor, the text processor, the C compiler, and the loader. Work presently underway includes a performance measurement subsytem, several adaptive schedulers, a demand paged memory manager, and a hardened file system.

NPS developed software is available as a nine track tp tape to any Bell Labs approved site.

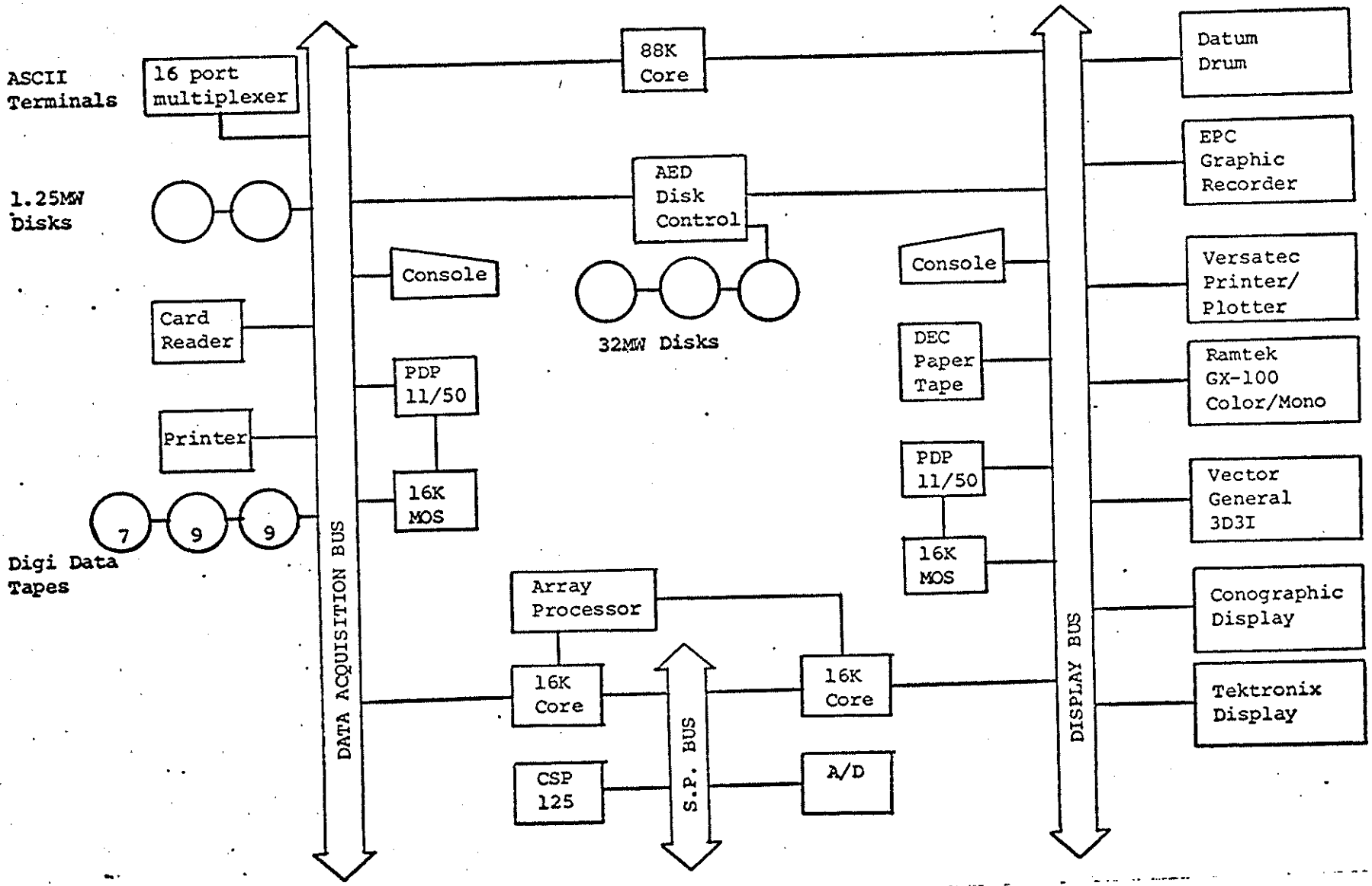

Figure 1. Configuration of the Signal Processing and Display Laboratory

Toronto Unix System

1) Hardware

Device	Existence	Driver
a) PDP11/45 - floating point - 80+K core	Yes	
b) SI 9500-I Disk	Soon	No
c) Diva dd14 Disk	Soon	No
d) 3-Rivers Graphic Wonder	Yes	Yes and No
e) GT-40	Leaving Soon	Yes
f) Versateck D1200A Printer/Plotter - DMA	Soon	No
g) Colour Video System	Being Built	No
h) Summagraphic Data Tablet	Yes	Yes
i) Calcomp Microfilm Plotter	Yes	No
j) line printer	Yes	Yes
k) card reader	Yes	No
l) 1600 BPI tape drive	Yes	Yes

2) Software Already Developed

a) GT-40 driver

b) New improved mag tape driver
- allows seeks in raw mode
- knows about files
- crashes less frequently

c) C paragrapher

d) "grabcore" - a system routine to free up and reserve a specific piece of core for double-port devices

Boston Children's Museum

UNIX at the Children's Museum has been fully operational since August, 1974. Development work jointly with Harvard University began the previous winter, making us one of the first non-Bell users.

Our hardware configuration includes :

*PDP11/40 processor with EIS
*40K core memory (MM/MF11-L)
*KW11L line clock
*2 RK03 (a.k.a. Diablo) disk drives on RK11-c controller
*6 VT05 terminals operating at 600 and 2400 baud on DL11-E controllers
*1 LA30 DECwriter at 300 baud on DL11-A
*1 ASR33 teletype on DL11-A
*1 ComData modem on dialup line, 110 baud on DL11-E
*1 LP11-HA upper/lower case 80-column line printer
*1 VOTRAX VS-5 voice synthesizer on DL11-E
*1 QUME Q30 high-quality 30-cps printer
(a.k.a. Diablo HyType, or the guts of the GSI etc. terminal) on DR11-C

Further, we are designing and will begin construction soon on several new hardware devices and interfaces, including a dirt-cheap DR11-C equivalent that is capable of driving our scaled-down elcheapo versions of things like the LOGO project's "turtle".

Our hardware and software is extensively kidproofed, and modifications have been made to the UNIX terminal driver to include modes whereby newline characters are ignored on "empty" or "null" lines, and whereby all characters typed by the user are thrown away if the system is in the midst of typing on the terminal. Attractive rubout handling (backspace-erase line) has also been added for VT05 terminals.

Software that we have developed that may be of interest to other users includes:

*FOCAL, written in C and modeled after PDP-8 FOCAL by a high-school student
*a PDP-8 simulator (simple memory-and-a-single-terminal machines only at this time), also in C, by the same student (interrupts are not currently being supported but are being worked on)
*a rewritten standard UNIX shell (pipelines not yet implemented) with user-settable prompts, a "change to default directory" command, standard accounting options, a monitor option that copies all typein to a hidden file (for keeping tabs on potentially malicious users), and others
*a new more-conversational PS command that displays critical process data in English (SWAPPED/IN CORE, SLEEP/WAIT/RUN, etc.)
*an RK disk driver that optimizes seeking through queue-diddling.

Under development and scheduled for imminent completion is a general-purpose information storage and retrieval system. A license fee will probably be made for this package, but all of the other items listed above are available free to nonprofits on request. Please contact me to discuss media conversion; we can supply RK disk, DECtape, or paper (gak) tape.

Bill Mayhew, The Children's Museum, Jamaicaway, Boston MA 02130

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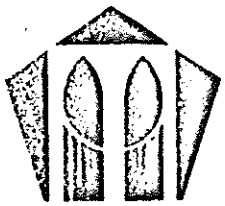

Data Acquisition Facility
School of Science
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of The City University
of New York
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Telephone: (212) 780-5569

July 31, 1975

The users of UNIX in New York City have been meeting regularly to discuss technical problems and ideas of mutual interest. We have initiated a UNIX Newsletter which will, we hope, serve as an information exchange medium for all users.

To avoid the possibility of running afoul of the non-disclosure portion of the license agreement, and still allow a free exchange of information, the Newsletter will be mailed to only one designated person at each licensed installation. She/he will, of course, be free to duplicate and distribute at her/his installation in accordance with the license agreement.

We have been given your name by the people at Bell Labs as a contact. We ask that you fill out and return the form below so that the first Newsletter is mailed to the appropriate person at your facility.

Sincerely,

Melvin Ferentz

_____
Date

Professor Melvin Ferentz
Data Acquisition Facility
3438 Ingersoll Hall
Brooklyn College of CUNY
Brooklyn, N. Y. 11210

The person whose mailing address and telephone number is listed below is designated to receive the UNIX Newsletter for our installation. (Where there is more that one UNIX installation under a single license, a person may be designated for each such installation.)

You may include this name and telephone number in a list of installation published in the UNIX Newsletter. (Strike this line if you object.)

Name _____
Mailing Address _____
_____
_____
_____

Telephone _____ _____
Area Number

_____
Signed